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June 9, 2014

VIA U.S. FIRST CLASS MAIL & E-MAIL

Ken Moraff
Acting Director, Office of Ecosystem Protection
U.S. Environmental Protection Agency, Region 1
5 Post Office Square, Suite 100
Boston, MA 02109-3912

RE: Supplemental Comments in Response to the Proposed New Hampshire Small Municipal Separate Storm Sewer Systems Draft General Permit, NPDES Permit Nos. NHR041000, NHR042000 and NHR043000

Dear Mr. Moraff:

On August 13, 2013, the Cities of Dover, Portsmouth, and Rochester joined other small municipal separate storm sewer system (MS4) communities throughout the state of New Hampshire in submitting comments on the proposed Small MS4 General Permit ("Draft Permit") as the New Hampshire Stormwater Coalition. Since the submission of the original comments, the Cities of Dover, Portsmouth, and Rochester ("the Great Bay Municipal Coalition") received updated information pertaining to the Great Bay Estuary impairment determinations which EPA relied upon in issuing the Draft Permit and thus, are submitting these supplemental comments on behalf of these Cities. This supplemental information (*e.g.*, peer review report, the DES settlement agreement as well as a federal district court decision on the legal impact of Section 303(d) impairment listings) was not available at the time the public comment period closed. Moreover, as the Agency has not issued a final permit these supplemental comments should be considered timely filed.

The following new information provides independent confirmation that additional nutrient-related stormwater best management practices are not needed at this time for the Great Bay Estuary, contrary to the assumptions made by EPA in issuing the draft permit. In particular, the new information confirms that nutrient impairments have not been documented for this system and that the prior impairment listing methodology was not scientifically defensible. The

District Court action confirmed that an impairment listing does not carry any legal presumption that pollutant reductions are needed from point sources. Thus, EPA's continued reliance upon the flawed technical and regulatory presumptions in issuing the final permit to mandate more restrictive nutrient-related best management practices would be arbitrary and capricious. A brief summary of the critical new information follows:

- In a recent District Court for the District of Columbia decision, the court found, at EPA's request, that simply placing a waterbody on the 303(d) list is not a sufficient basis for imposing additional requirements on a discharger to the impaired waterbody. *City of Dover v. EPA*, No. 12-1994, slip op. at 15 (D.D.C. Apr. 14, 2014). It is only (a) the development and implementation of a TMDL or (b) a site-specific NPDES permit analysis considering the factors presented in 40 C.F.R. § 122.44(d) that can provide a sufficient legal/factual basis for imposing additional requirements on the discharger. *Id.* Thus, EPA's attempt to impose additional reduction requirements on the Great Bay MS4 communities simply because these waters have been placed on the 303(d) list is improper. There is no federal rule or law that imposes presumed reduction requirements for discharges to impaired waters.
- A recently released Peer Review Report of the New Hampshire Department of Environmental Services' 2009 document entitled "Numeric Nutrient Criteria for the Great Bay Estuary" ("2009 Criteria document") which was (1) the underlying basis to conclude that these waters were nutrient impaired, (2) used in preparing DES 2010 Wasteload Allocation document which identified necessary total nitrogen ("TN") load reduction requirements for point source dischargers, and (3) served as EPA's primary basis for including stringent TN limits in various NPDES permits. The Peer Review Report concluded that the data and analyses contained in the 2009 Criteria document were too simplified and lacked the necessary analyses to reasonably conclude that nitrogen is causing the eelgrass decline or low dissolved oxygen ("DO") in this Estuary. More recent eelgrass studies in similar systems confirmed that TN levels in this system are *below* the thresholds shown to be related to significant eelgrass impairment. The peer review concluded the weight of evidence *does not* show that TN caused or is causing the observed eelgrass decline or any excessive plant growth in this system.
- In light of this peer review, DES and the Coalition signed a settlement agreement precluding further use of the numeric criteria or the analyses contained in the 2009 Criteria document in developing future 303(d) lists or related regulatory actions (*e.g.*, the need for nutrient reduction). Given DES, the author of the 2009 Criteria document, has decided to no longer support the use of the 2009 Criteria document as a basis for narrative criteria development/implementation, it would be improper for EPA to rely

further on the 2009 Criteria document or data and analyses contained therein, or the 2010 Wasteload Allocation Report in developing and finalizing the Draft Permit.

- Furthermore, new information and data for the Estuary, which include additional ambient nutrient data through 2012, confirm that growing season nitrogen levels have not materially changed since 2003 and therefore, could not be the cause of later occurring eelgrass declines in the system. Moreover, recent datasonde information from 2012 and 2013 confirm DO concentrations in the Piscataqua River are excellent and not above impairment levels. Thus, based upon the current, site-specific data for the Estuary it would be improper for EPA to conclude the Great Bay Estuary is nutrient impaired.
- Moreover, even if the now abandoned 0.3 mg/L TN objective was still utilized by EPA for this system, stormwater nutrient reductions are clearly not necessary to ensure attainment of that objective on a growing season basis given (1) the current growing season TN concentrations (averaging approximately 0.32 mg/l TN since 2009) and (2) hydrodynamic modeling indicates that TN limitations in the range of 10-14 mg/l for Dover and Rochester (in conjunction with limitations already imposed on Exeter and Newmarket) would be sufficient to ensure compliance with that objective in Little Bay and Great Bay. Thus, additional stormwater reductions are not needed to ensure attainment of this now-abandoned narrative criteria translator.

Based on the new information contained in these supplemental comments and the earlier comments submitted by the Coalition, EPA's proposed permit action is technically and legally flawed. Therefore, the portions imposing implementation of additional best management practices on the Great Bay communities due to alleged nutrient impairments should be withdrawn.

Thank you for your consideration of these comments. We look forward to the Region's response.

Sincerely,



John C. Hall

Enclosures:

Cc: Coalition Members

Dan Arsenault, EPA

Proposed New Hampshire Small MS4 General Permit – Supplemental Comments of the Great Bay Municipal Coalition

The Great Bay Municipal Coalition (“the Coalition”) is an organization dedicated to the establishment of appropriate and cost-effective restoration measures to protect Great Bay and its resources. The Coalition members include the Cities of Dover, Portsmouth, and Rochester. These communities are directly impacted by the proposed New Hampshire Small Municipal Separate Storm Sewer Systems (“MS4”) Draft General Permit, NPDES Permit Nos. NHR041000, NHR042000 and NHR043000 (“Draft Permit”). These comments supplement the New Hampshire Stormwater Coalition comments, which the individual members of the Great Bay Municipal Coalition joined in submitting, on August 13, 2013. As the final permit has not been issued, these comments and new, relevant information should be included as part of the administrative record for the Draft Permit in accordance with 40 C.F.R. § 124.18(c); *see also* EPA Region 1’s Memorandum in Opposition to the Petition for Review, *In re Town of Newmarket*, 16 E.A.D. __ (EAB 2013) (Filing #23), at 78¹ (“EPA did include the supplemental comments [submitted before the issuance of the final permit] as part of the administrative record and did consider them.”). Based on these supplemental comments and the earlier comments submitted, the Coalition objects to this permit action as technically and legally flawed and requests that the proposed permit action be withdrawn or modified consistent with these comments.

Supplemental Issues

- 1. As EPA admits, the inclusion of the Great Bay Waters on New Hampshire’s 303(d) list does not mean that additional requirements may be given to these communities until a TMDL has been promulgated and thus, the additional requirements in the Draft Permit should be withdrawn.**

EPA, in a recent District Court case, argued that “the presence of the Great Bay Estuary waters on the impaired waters list did not, and will not, cause the effects of which plaintiffs complain” (*City of Dover v. EPA*, No. 12-1994, slip op. at 10 (D.D.C. Apr. 14, 2014) (Attachment 1)) – *i.e.*, “a linchpin for a cascade of regulatory actions.” *Id.* at 9. EPA made clear that just because the Great Bay waters have been listed as impaired on the 303(d) list, no additional regulatory requirements stem from simply being placed on the list. As the court stated:

This is not to say that 303(d) lists never affect permitting decisions – they just do so indirectly. Plaintiffs leap past an intermediate step. When a body is placed on the 303(d) list, the state must establish a TMDL for that body of water for pollutants that are ‘preventing or expected to prevent attainment of water quality standards.’ 40 C.F.R. § 130.7(c)(1)(ii); 33 U.S.C. § 1313(d)(1)(C). This is not an immediate process, however. ... Once a TMDL is issued, it certainly can affect NPDES permits.

¹ Available at, http://yosemite.epa.gov/oa/EAB_Web_Docket.nsf/77355bee1a56a5aa8525711400542d23/f3e50bfc8280e25f85257ad70069d379!OpenDocument.

Id. at 15 (footnote omitted). Although the Great Bay Waters are listed as impaired for nitrogen, DES has not promulgated a TMDL. As even EPA has admitted, it would be improper to use the listing determinations as the basis for requiring the Great Bay small MS4s to comply with additional requirements under the Draft Permit. Thus, the additional requirements specified in the Draft Permit, Appendix H – Requirements Related to Nitrogen Impaired Waters in the Great Bay Estuary and Chloride Impaired Waters, which are based upon the presumption that, under 40 C.F.R. § 122.44(d) stormwater contributions must be further limited because the waters are designated as impaired, should be withdrawn.

Moreover, in the decision the court also explains:

The permitting regulation explains that, “[w]hen determining whether a discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above a narrative or numeric criteria within a State water quality standard, [EPA] shall use procedures which account for” several different factors, none of which is 303(d) listing. 40 C.F.R. § 122.44(d)(1)(ii) (EPA must account for existing controls on sources of pollution, variability of the pollutant in the discharge, sensitivity of the species to toxicity testing, and dilution of effluent in water). Simply put, the 303(d) listing determination and the section 122.44(d)(1)(i) determination are wholly separate. Hence to make the 303(d) list determination, EPA asks whether a particular body of water is polluted; to make the section 122.44(d)(1)(i) reasonable potential determination, EPA asks whether a particular source is discharging too much of a pollutant.

Id. at 14. The court makes clear that EPA must, using all the factors under § 122.44(d), demonstrate that an effluent limitation is necessary. In the draft permit, EPA presumes that permittees are causing or contributing to an impairment. Draft Permit at 19, Section 2.2.2.a(i)(a). EPA shifts the burden on the permittee to demonstrate that it is not causing the impairment in order to avoid implementing BMPs. Fact Sheet, at 51, 52-53. This is clearly impermissible under the regulations and thus, EPA should delete any and all requirements that are based upon the presumption that the MS4 is “causing or contributing” to impairments.

2. **EPA’s reliance on the DES 2009 Criteria document in deriving additional requirements for Great Bay communities in the Draft Permit is no longer appropriate as an updated, far more detailed peer review of the 2009 Criteria document concluded that the document provides no scientifically defensible basis for finding nitrogen is causing eelgrass population declines in the Great Bay Estuary.**

DES submitted the “Amendment to the New Hampshire 2008 Section 303(d) List Related to Nitrogen and Eelgrass in the Great Bay Estuary” (NHDES-R-WD-14) on August 13, 2009, listing the Great Bay waters as impaired for nitrogen. The basis for such listings were the data and analyses contained in the DES document entitled “Numeric Nutrient Criteria for the Great Bay Estuary” (June, 2009, NHDES-R-WD-09-12) (“2009 Criteria document”). However, in April 2013, DES and the Coalition entered into a Peer Review to jointly undertake an

independent peer review of the 2009 Criteria document.² The four peer review panelists were jointly selected because of their national expertise in nutrient impacts to estuaries including modeling for nutrient impacts and eelgrass and marine biology. The peer reviewers were asked to answer numerous specific questions regarding the scientific basis for the conclusions reached in the 2009 Criteria document including the claim that nitrogen is the primary cause of eelgrass changes in the Estuary. The peer reviewers released a joint report (“the Report”) of their findings on February 13, 2014. Attachment 2.³ The Report concludes that the data and analyses contained within the 2009 Criteria document do not demonstrate that nitrogen has historically caused or is currently causing eelgrass populations to decline in this system. The Report concludes that the 2009 Criteria are not scientifically defensible and should not be relied upon in making regulatory decisions. Below is a sample of the key findings contained within the Report that are relevant to the Draft Permit.

a. No Scientifically Defensible Linkage between Nitrogen and Eelgrass Presented in the 2009 Criteria Document

“There is no basis for a scientifically defensible linkage between nitrogen impairment and eelgrass impairment presented in the report.” Attachment 2, at 19 (Kenworthy).

b. Critical Deficiency with the 2009 Criteria Document – No Confounding Factors Analyses Conducted

“A critical deficiency in the DES 2009 Report was the fact that DES did not attempt to present evidence for ruling out the other factors listed above that could be controlling the presence or absence of eelgrass (e.g., temperature, water motion, wave action, bathymetry, water residence time, substrate type, substrate quality, severe storms, disease, epiphytes, and plant reproduction).” Attachment 2, at 14 (Kenworthy).

“The DES 2009 Report did not adequately demonstrate that nitrogen is the primary factor in the Great Bay Estuary because it did not explicitly consider any of the other important, confounding factors in developing relationships between nitrogen and the presence/health of eelgrass.” Attachment 2, at 18 (Bierman).

c. Algal Growth is Not Demonstrated to Be Causing or Significantly Contributing to a Loss of Eelgrass and Nitrogen Reductions will Not Significantly Improve the Conditions for Eelgrass Growth

“An immediate observation is that not only is chlorophyll-a a small component of Kd, median chlorophyll-a concentrations in Great Bay are low and range between 1-7 µg/l (Table 6). It is unlikely that reductions in nitrogen concentration could cause significant

² The prior peer review (1) had a far more limited scope of review and (2) did not consider the updated studies, data, and analysis relevant to the credibility and scientific defensibility of the 2009 Criteria document. Consequently, the earlier peer review report does not provide a basis for concluding that 2009 Criteria document is still defensible.

³ Available at, http://www.portsmouthwastewater.com/PDFs/Joint_Report_Final_PeerReview_GreatBayEstuary_021314.pdf.

improvements in light by causing reductions in chlorophyll-a concentration.” Attachment 2, at 24 (Bierman).

“Regressions K_d versus nitrogen concentration are based on weak evidence and are unreliable due to lack of explicit consideration of all the underlying direct/indirect linkages among the relevant stressor variables, response variables and confounding variables.” Attachment 2, at 25 (Bierman).

d. The Statistical Methods Used to Derive the Numeric Thresholds Were Not Based On Acceptable Scientific Methods

“The statistical methods used to derive the numeric thresholds were not based on acceptable scientific methods and the results of these analyses are not reliable for predicting the complexity of responses to changes in nitrogen concentration in the system, including DO, transparency, eelgrass, macroalgae and phytoplankton.” Attachment 2, at 35 (Bierman).

“The results in the 2009 report are not acceptable or reliable for setting nutrient criteria.” Attachment 2, at 38 (Reckhow).

e. The “Weight of Evidence” Does Not Support the Conclusion that Excess Nitrogen Was the Primary Factor that Caused the Decline of Eelgrass Populations and Low DO in the Tidal Rivers

“The data and arguments provided in the DES 2009 Report to support the weight of evidence for a relationship between nitrogen concentration, macroalgal abundance and eelgrass loss are neither compelling nor scientifically defensible. [Subsequent data from 2008, 2009, and 2010 indicate] macroalgae were not limiting eelgrass growth.” Attachment 2, at 27 (Kenworthy).

“Relative to weight of evidence, the data presented are likely sound but are not properly applied to linking benthic conditions with low DO and subsequently to linking low DO with total nitrogen concentrations.” Attachment 2, at 46 (Diaz).

“Scientific knowledge indicates a causal linkage between TN and DO, due to the growth and decomposition of algae. However, the data analysis does not support this TN-DO linkage in the NH DES data.” Attachment 2, at 48 (Reckhow).

“Eelgrass cover data subsequent to the DES 2009 report (Table 1) indicates eelgrass is declining in locations (reference locations) where the nitrogen concentrations are similar to the proposed criteria; hence other factors must be operating to affect the changes in eelgrass cover.” Attachment 2, at 49 (Kenworthy).

f. DES Failed to Properly Consider Data from Other Similar Estuarine Systems

“DES failed to acknowledge the relevance of some very important differences between the MEP [Massachusetts Estuary Program] program’s approach and the DES approach.

Also, important differences in some the physical characteristics of Great Bay and the embayments of Massachusetts were not acknowledged, implying that DES did not consider the relevance of the differences and how they could affect interpretation of water quality monitoring data. Furthermore, by making a simple comparison to the MEP program without a comprehensive evaluation of the status of that program, DES was irresponsible in making the comparison and implying that it supports total nitrogen criteria proposed for the Great Bay.” Attachment 2, at 50 (Kenworthy).

“[A] simple comparison of total nitrogen values derived in the MEP cannot support the nitrogen concentration proposed by DES.” Attachment 2, at 51 (Kenworthy).

“The proposed DES total nitrogen criteria in Great Bay (annual median of 0.25 – 0.30 mg total nitrogen) are about half the threshold concentration identified by Wazniak et al. (2007), so it appears that the DES criteria are more conservative and potentially more protective of eelgrass than identified for the Maryland coastal bays.” Attachment 2, at 52 (Kenworthy).

“To help better identify the potential total nitrogen criteria for Great Bay, DES should also consider the results of a recent study conducted in collaboration with the MEP program in Massachusetts (Bensen et al. 2013). ... These results corroborate values reported by Wazniak et al. (2007) discussed above, indicating that concentrations on the order of about 0.6 mg/l total nitrogen correspond with degrading eelgrass beds.” Attachment 2, at 52 (Kenworthy).

In the Draft Permit, based upon DES’ 2008 Listing determinations and the 2009 Criteria document, EPA provided additional requirements for small MS4s that “discharge directly to nitrogen-impaired waterbodies in the Great Bay Estuary watershed or their tributaries ...” Appendix H- Requirements Related to Nitrogen-Impaired Waters in the Great Bay Estuary and Chloride-Impaired Waters; *see also* Draft Permit, Sections 2.2.2-2.2.3. Based upon this Report, it is clear that the 2009 Criteria document wholly overlooked or insufficiently assessed the factors necessary to demonstrate that the supposed cause-effect relationship between nitrogen and decline eelgrass exists in this system. Moreover, the statistical methods used to develop the numeric nutrient criteria were not based on acceptable scientific methods and the results of these analyses were not reliable for determining that nitrogen is causing the eelgrass declines (or low DO) in the system or the level of nitrogen needed to protect eelgrass resources. Thus, EPA’s reliance on the impairment listings in providing additional requirements for small MS4s in the Great Bay Estuary is improper and EPA, consequently, should withdraw Appendix H from the Draft Permit.

3. In light of the Peer Review, DES agrees not to use the total nitrogen numeric thresholds derived and developed in the 2009 Criteria document for further impairment listings and agrees to revise its listing methodology.

After carefully assessing the findings and ramifications of the final peer review report, DES agreed with the Coalition that there are serious questions about the scientific defensibility of the 2009 Criteria, the appropriateness of previous nitrogen impairment findings and that DES needs to revisit the methods it uses for the assessment of areas which have, or historically had, eelgrass

populations. Attachment 3. The Coalition and DES entered into a settlement agreement in *Dover et al. v. DES, State of New Hampshire Supreme Court*, Docket No. 2013-0119, agreeing to the following:

- DES will no longer use the 0.45, 0.30, 0.27 or 0.25 mg/L total nitrogen numeric thresholds as derived and developed in the 2009 Criteria document in its Section 305(b) and 303(d) water quality assessments for the Great Bay Estuary, including the Cocheco and Piscataqua Rivers, and Portsmouth Harbor, and,
- DES will modify its State of the New Hampshire 305(b) and 303(d) Consolidated Assessment and Listing Methodology date January 2014, in a manner consistent with the statement listed above.

Attachment 3. As DES (the author of the 2009 Criteria document), in light of the peer review, has agreed that the 2009 Criteria document is not reliable for narrative criteria implementation and, therefore, should no longer be used as the basis for deriving and developing its Section 305(b) and 303(d) water quality assessments for the Great Bay Estuary, it would be arbitrary and capricious for EPA to finalize the Draft Permit which contains additional requirements for the Great Bay communities based upon the 2009 Criteria document. *See Texas Oil & Gas Ass'n v. EPA*, 161 F.3d 923, 935 (5th Cir. 1998) (“When an agency adopts a regulation based on a study [that is] not designed for the purpose and is limited or criticized by its authors on points essential to the use sought to be made of it the administrative action is arbitrary and capricious and a clear error in judgment.”) (*quoting Humana of Aurora, Inc. v. Heckler*, 753 F.2d 1579, 1583 (10th Cir. 1985), *cert. denied*, 474 U.S. 863 (1985)). Thus, given the settlement agreement, EPA’s continued reliance on the 2009 Criteria document or the analyses contained within to conclude a TN impairment exists or has the reasonable potential to exist would be improper. Moreover, § 122.44(d) requires EPA to utilize published state policies with respect to narrative criteria implementation and relevant site specific information in developing effluent limitations. 40 C.F.R. § 122.44(d)(1)(ii). DES’s conclusion that the 2009 Criteria document is flawed and should no longer be used in a regulatory context is therefore binding on EPA. *Texas Oil & Gas Ass'n*, 161 F.3d 923; *Am. Iron & Steel Inst. v. EPA*, 115 F.3d 979, 999 (D.C. Cir. 1997) (“Under EPA regulations, a permitting authority ‘must use all relevant available data, including facility-specific effluent monitoring data where available’...” (citing 40 C.F.R. § 122.44(d)(1)(ii)). Thus, given DES’s decision to no longer support the use of the 2009 Criteria document as a basis for narrative criteria development, it would be improper for EPA to continue rely upon the data and analyses contained in the 2009 Criteria document as reasonably demonstrating the need for TN control, in developing and finalizing the Draft Permit. EPA should withdraw the sections of the Draft Permit which rely upon the impairment listings for the Great Bay Estuary as there is no scientific basis for such listings. Draft Permit, Sections 2.2.2-2.2.3; Appendix H- Requirements Related to Nitrogen-Impaired Waters in the Great Bay Estuary and Chloride-Impaired Waters.

4. Analysis of long term nitrogen data for the Great Bay Estuary using a growing season average confirms that the eelgrass declines that occurred after 2005 are not a function of TN or DIN levels in the system.

Under § 122.44(d), EPA must consider the current available information for the Estuary and point source inputs in developing effluent limitation. 40 C.F.R. § 122.44(d)(1)(ii). Based upon a more refined assessment of the current data for the system focusing on growing season averages and reflecting current treatment levels, it is clear that TN, DIN, and TSS levels have remained stable (or declined) during the eelgrass growing season even though eelgrass levels have fluctuated widely. These “growing season” analyses confirm (1) TN is not the cause of eelgrass declines and (2) water quality is far better than EPA originally presumed based on annual average analyses.

However, closer inspection of the data for the Estuary has revealed an inherent, unintended bias in drawing conclusions based upon annual summaries of the data. Winter readings varied widely while growing season levels did not. This bias in the data sets has inadvertently led to clearly inappropriate conclusions regarding the influence of TN levels on eelgrass health and macroalgae growth in this system. Re-evaluation of the data on a growing season basis (the relevant exposure period for eelgrass and macroalgae effects) confirms that there is no apparent eelgrass/macroalgae-TN relationship for this system based upon the data from 2003 to 2012. This period encompasses conditions when eelgrass was considered healthy and significantly impaired. The basis for this conclusion is discussed below.

a. Growing Season Analysis of Nutrient and Eelgrass Data

In general, the health of the eelgrass and the degree to which cultural eutrophication is occurring (*e.g.*, increased macroalgae, epiphyte or phytoplankton growth) is dependent upon the growing season (April – October) nutrient conditions and not conditions occurring in winter months. For example, macroalgae and epiphyte growth primarily occurs in warmer months (June – October) and, therefore, DIN or TN levels occurring in the remainder of the year are simply irrelevant to such plant growth. Likewise, any trend assessments on possible impacts of TN or DIN on eelgrass populations (direct or indirect) should have focused on whether such conditions changed during the eelgrass growing season (April – September). Nutrient conditions occurring during the non-growing season (October – March) are not relevant to assessing impacts on this metric. This is particularly true given the limited detention time for the system which flushes out such nutrient levels quickly. Attachment 4- HydroQual Hydrodynamic Model, at 9-10 (showing the detention time in Great Bay/Little Bay and the Piscataqua River to be about one day).

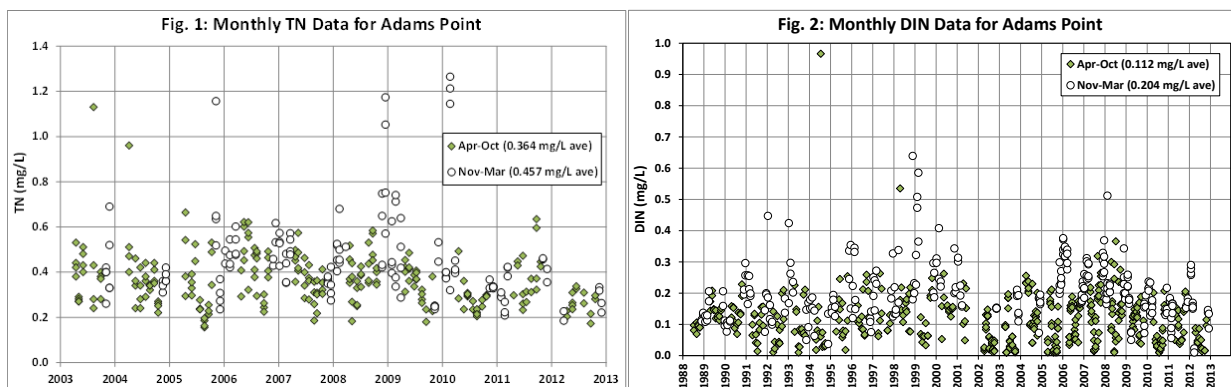
Based on a growing season analysis of the data, as presented in Figures 1 through 7 below, it is clear that:

- Eelgrass declined sharply despite relatively constant DIN, TN and TSS levels.
- There are no apparent increasing TN, DIN or TSS trends for this system.
- The changes in eelgrass populations that occurred after 2005 are plainly not a function of the TN or DIN levels in this system.

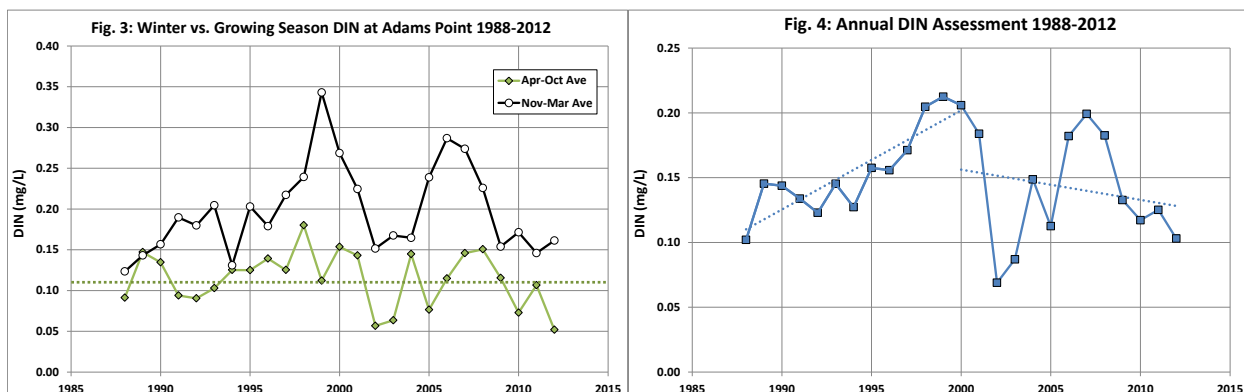
- Consequently, there is no objective basis to find that this Estuary is nutrient-impaired or TN levels somehow controlled eelgrass losses.

The following provides a more detailed discussion of the basis for these conclusions:

Figures 1 and 2 plot the monthly readings associated with the data used to derive PREPs long term trend data for DIN and TN. The data confirm that non-growing season readings for these parameters are significantly higher than the growing season values and thereby, tend to control the annual average values presented in the PREP reports. The non-growing season TN values are about 30% higher than growing season TN values and DIN values are almost double in the non-growing season. The growing season TN levels averaged 0.36 mg/l over the period of record, which is well below the TN level associated with eelgrass declines in other east coast estuaries in Massachusetts and Maryland. Attachment 2, at 52. Growing season average data for 2012 is actually *below* 0.3 mg/l TN, the target value originally recommended by DES and EPA to fully protect eelgrass in Great Bay.



When the long term growing season DIN levels are assessed, it is apparent that growing season DIN did not double in the mid-1990s as presented in the PREP reports. From 1989 through 2011, growing season DIN readings generally remained within a very tight range: 0.10 – 0.15 mg/l. Figure 3.



However, if the winter DIN readings were included, the picture changes dramatically. Significant increases in DIN appears from 1996-2001 and again in 2005 to 2008. Consequently, analyzing the changing DIN on an annual basis indicates that DIN increased dramatically from 1989 to

2000 (the period when eelgrass populations were stable and robust) and, thereafter, declined from 2001 to 2011, the period when eelgrass populations became unstable. Figure 4. The reality of this situation, however, is that growing season DIN levels have not materially changed in this system for over the past 20 years. As this parameter has not materially changed in the growing season it cannot be the cause of the more recent eelgrass declines in the system.

Figure 5 shows that from 2003-2012, the period of greatest eelgrass changes in this system, growing season TN levels remained virtually unchanged throughout this period. While there was a slight increase in TN concentrations in 2006-2008, no one could rationally conclude that a 0.025 mg/l change in TN (from 0.371 to 0.396 mg/l) could cause a 30% decline in eelgrass acres in Great Bay. Figure 5; *see also* Attachment 2, at 52 (finding that TN ranges of 0.5-0.6 mg/l are associated with healthy eelgrass growth in nearby estuarine systems). If such a slight change in TN was critical to eelgrass health, then the period from 2009 through 2012, when growing season TN levels dropped to their lowest levels in a decade, should have allowed full eelgrass restoration to occur but it plainly did not. Obviously, other factors are controlling eelgrass health in this system, as concluded by the 2014 peer reviews.

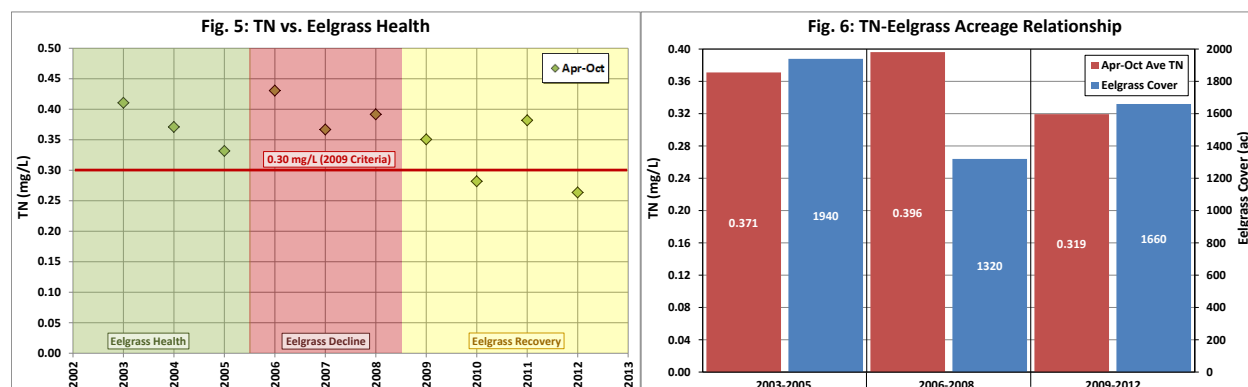


Figure 6 also shows that for the past four years, the system has averaged 0.32 mg/l TN (significantly lower than the TN level 2003-2005) yet eelgrass populations are still well below the acreage seen in 2003-2005 (1940 acres versus 1660 acres). Based upon these figures, it is clear that TN is not controlling eelgrass growth in this system. Nor could one rationally expect that epiphyte growth is more of an issue now than it was when eelgrass were healthier in the mid-1990s through 2005. Both TN and DIN levels are presently lower than they have been in a decade. *Lower* nutrient levels during the growing season cannot be expected to trigger *higher* epiphyte or macroalgae growth. These lower TN levels also confirm that it was improper to conclude drastic TN reductions were needed at point sources to meet a 0.3 mg/l TN level. Only minor reductions are actually needed, based on current data for this system. It should be further noted that based on the projected water quality associated with existing improvements at Rochester and scheduled wastewater plant improvements for all facilities achieving 8 mg/l, excluding Portsmouth, growing season water quality will be well below 0.3 mg/l TN.

Finally, the PREP report indicated that increasing TSS concentrations occurring in the system were caused by declines in eelgrass populations. This statement could only be true if growing season TSS levels increased in 2006 to 2008 when eelgrass populations were at their lowest.

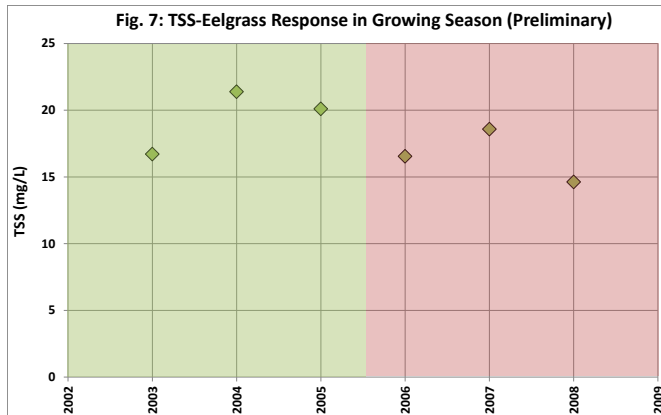


Figure 7 shows that over the period where eelgrass populations in Great Bay declined the most (in 2006-2008) the growing season TSS levels actually appear to only have *declined slightly*. Thus, it is clear that TSS concentrations during the growing season have not been materially impacted by the shifting eelgrass populations as DES had originally concluded. Moreover, it is apparent that EPA's reliance on the DES annual average data analyses was misplaced and led to inappropriate regulatory conclusions.

b. Conclusion of Growing Season Data Analyses

Under § 122.44(d), EPA is required to consider the most current, site-specific data for the system and thereby, EPA must consider the more refined assessment of the system data presented above. Based on a more refined analysis of the data collected at Adams Point, it is apparent that the historical methods of data analysis (*i.e.*, using annual summaries of the data) for this system created an inherent bias in the data assessment and conclusions drawn from that data. Given that a primary focus of PREP and DES were the assessment of whether and how cultural eutrophication was occurring in this system, the data analysis should have focused primarily on changes in DIN, TN, and TSS during the growing season to adequately determine whether these conditions were the cause of or related to the eelgrass declines in the system. When the growing season averages are assessed, it is apparent that TN levels (and DIN levels) had nothing to do with the changing eelgrass populations since growing season concentrations for these parameters have remained stable for decades and are now at their lowest levels. EPA's continued reliance on the misplaced and inherently biased assessments would be inappropriate given its conclusion that the period of concern is the growing season.

Factors Controlling System Transparency are Natural, Not Eutrophication Induced

Of the three components that may affect system transparency (an important factor for eelgrass health) it is apparent that two have not changed – phytoplankton growth and TSS. Previous analyses show a correlation between changing weather patterns on system transparency and eelgrass populations due to increased runoff and natural CDOM contributions to the system. Attachment 5 - Evaluating the Efficacy of Nitrogen Control Measures for the Great Bay Estuary: A Synopsis of Relevant Ecological Studies and Nutrient Trend Assessments, at 20-25, 27-28. This correlation provides the only rational explanation for changes in eelgrass populations in this system and why controlling TN from any source would not materially affect such conditions.

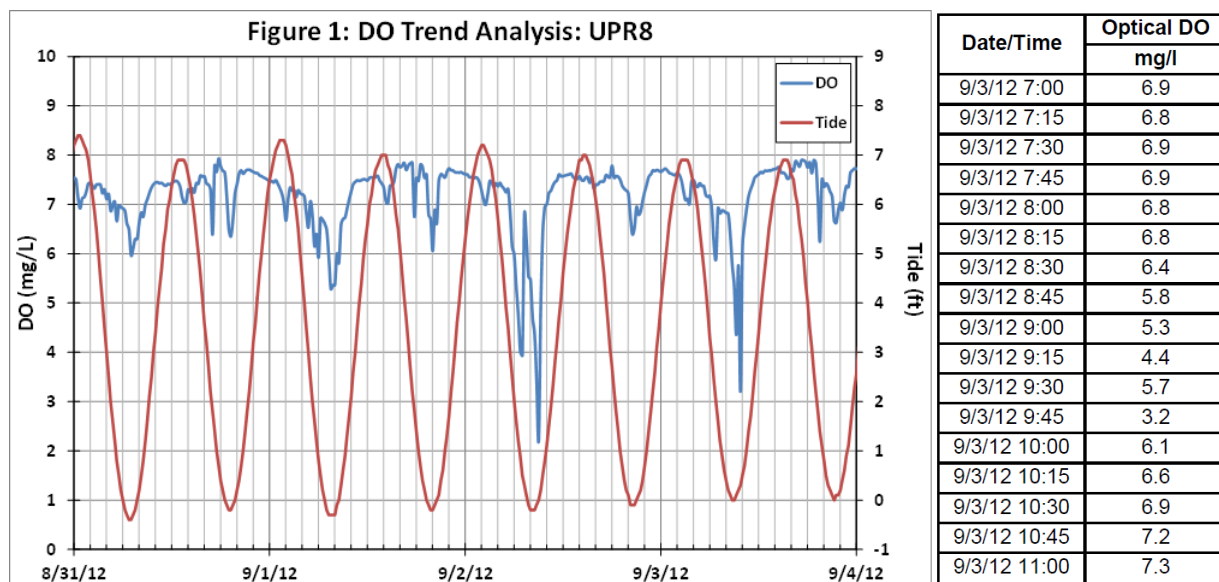
Finally, concerns regarding macroalgae and epiphyte growth are diminished given this information. If nutrient levels have *decreased* to the lowest levels in a decade, one cannot reasonably expect that nutrients are responsible for an *increase* in these forms of plant growth, assuming increased growth is actually now occurring in the system.

In conclusion, EPA has erroneously failed to analyze the data based upon growing season averages. Moreover, EPA and DES have inadvertently failed to recognize the bias associated with annual averages data assessments in finding that the Great Bay Estuary is nutrient impaired for eelgrass loss. However, when the data are analyzed using growing season averages, it is clear that TN, DIN, and TSS levels have stayed relatively constant over time while eelgrass populations have fluctuated dramatically. There is no correlation or connection between TN, DIN, and TSS and eelgrass growth for the system as confirmed by the site-specific growing season data. EPA's conceptual model does *not* apply. EPA is required under 40 C.F.R. §122.44(d) to consider the relevant available science for the Estuary in determining whether a discharge causes or has the reasonable potential to cause or contribute to an in-stream excursion above the narrative criteria. Thus, based upon the available data it is clear during the growing season nitrogen is not the cause of eelgrass loss and EPA should withdraw the additional requirements within the Draft Permit for Great Bay communities found in Section 2.2 and Appendix H.

5. The most recent DO readings for the Piscataqua and the Cocheco Rivers indicate that the Rivers are not impaired and are meeting applicable water quality standards.

During 2012 and 2013 significant additional DO monitoring was conducted by both EPA and the Great Bay Municipal Coalition. These data were collected, in part, to resolve whether nutrients were causing eutrophication conditions that could lead to periodic DO criteria exceedances. The datasonde readings for the Upper Piscataqua River and the Cocheco River from July 2012 to September 2012 are presented in Dr. Stephen H. Jones and Thomas K. Gregory, "Piscataqua River- Portsmouth Harbor Water Transparency Field Study Filed Sampling & Monitoring Report" (Jones and Gregory, 2013) without the data readings previously provided to DES. Attachment 6. These monitoring events confirm that DO levels in the Upper Piscataqua and Lower Cocheco Rivers are excellent averaging 7.4 mg/L and 7.7 mg/L, respectively. This information is consistent with historical information collected by DES as part of the CWA Section 303(d) assessment process. Based on these continuous measurements and other grab samples taken over time, these receiving waters meet applicable standards and there is no apparent basis for indicating a nutrient related impairment of these waters.

It should be noted that, oddly, EPA's datasonde readings at one station located on the Upper Piscataqua River (UPR8 station – where the *greatest* tidal exchange exists) had several sharp swings in DO concentration ranging from 2.0 mg/L to 8.5 mg/L. These the steep drops all occurred during low tide over very short time intervals – 15-30 minutes. *See* Figure 1 (below).



These data could lead one to conclude that some type of DO impairment exists in the Piscataqua River; however, closer inspection of the data indicates that the readings are unreliable and therefore, undermine any conclusions that DO impairments exist in the Piscataqua River. The most plausible explanation for such swings in the readings is that the DO probe was being fouled at low tide and then cleaned itself. As an example, on September 3, 2012, the readings (see above) went from 5.7 mg/L to 3.2 mg/L and back to 6.1 mg/l in a 30 minute interval. Although, it can be expected that there will be some variance in the readings in any water body, a drop in DO of 2.5 mg/L in a 15 minute span in a water body of this size would not be expected to occur naturally. The DO demand in the water would have had to increase dramatically then decrease just as dramatically. Also, DO changes due to algal respiration do not suddenly materialize during slack tide. Certainly the minor amount of algae growing in the waters (typically < 5 µg/l chlorophyll-a) could not possibly have caused such a result. Thus, there is no rational explanation for why these drastic spikes would naturally occur and it would be impossible for such DO changes to be attributed to nutrient concentrations. Therefore, it appears that the most plausible explanation is that the DO probe is being fouled at low tide, given the considerable tidal variation (2 meters) present at this location.

Dr. Stephen H. Jones and Thomas K. Gregory (University of New Hampshire, Jackson Estuarine Laboratory) experienced the same drastic swings in some datasonde readings in 2013 when they sampled in the Piscataqua River and Portsmouth Harbor. *See Attachment 6.* The Report states:

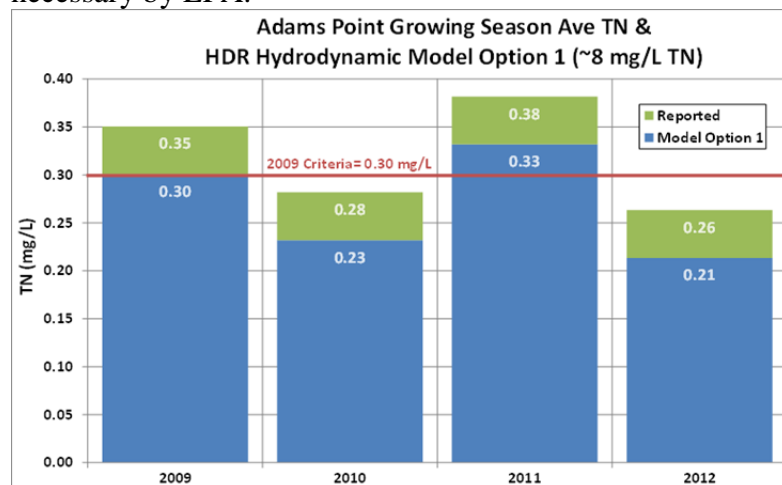
The sondes gave false readings at times, based on existing knowledge and the conditions at the time of the questionable readings. ... For example, there were times for all three sondes where the DO concentration and % saturation would drop to 0 for one time reading, then return to the levels found prior to the single-time reading. This happened 16 times at Site 1, 6 times at Site 2 and 8 times at Site 3 ... Otherwise, all other DO readings were >79.7% saturation and 6.55 mg/L ... These readings suggest non-limiting DO at all times during the study period.

See Attachment 6, at 8. Thus, it appears that these short term, drastic swings are an artifact of the sampling technology. Now the datasonde data exist and the most recent DO readings for the Piscataqua River and the Cocheco River indicate that these rivers are not impaired for DO and rather, that the DO levels in these rivers are excellent. Consequently, there is no basis to conclude that nutrient levels in the Piscataqua River are causing impairment to the DO regime.

6. The Great Bay communities have already committed to voluntary actions to reduce their nitrogen discharges which will bring nutrient levels in the system to below the 0.3 mg/l target.

The Great Bay Estuary, based upon the latest data, has been averaging 0.32 mg/l TN. *Supra*, at 13. In the 2009 Criteria document, DES erroneously believed that the current water quality of the Estuary was 0.42 mg/l based on the annual average assessment. Therefore, as noted above, major reductions in TN are not required even if the 0.3 mg/l objective is deemed appropriate for the Estuary; only minor adjustments to WWTP would mean the 0.3 mg/l objective would be met. If 0.3 mg/l objective is deemed appropriate then voluntary reductions already being made by the Great Bay communities would clearly place the Estuary below this objective and a 3.0 mg/l TN limitation cannot be necessary to achieve narrative standards.

Using the HydroQual hydrodynamic model and isolating the WWTP loads, similar to the analysis contained in the DES 2010 Wasteload Allocation document, it is clear that the TN levels in the system will be below the 0.3 mg/l objective during the growing season once the Great Bay communities implement their voluntary TN reductions. These voluntary TN reductions include the City of Dover is constructing to meet a monthly average total nitrogen discharge limit of 8 mg/l and the City of Rochester is modifying its plant operations to meet a 12 mg/l nitrogen limit. There are other communities in the Estuary who are scheduled to either go to an 8 mg/l or a lower nutrient limit. When the hydrodynamic model is run inputting these nitrogen loads from the WWTP (see below chart below showing the parameters for Option 1), the growing season average TN will decrease from its current level of 0.32 mg/l to 0.27 mg/l. *See Figure below, Option 1 showing a decrease in current TN levels by 0.05 mg/L. Thus, the voluntary actions which the Great Bay communities have committed to will place growing season TN levels well below the 0.3 mg/l objective obviating the need for stringent TN limits as originally believed necessary by EPA.*



Scenario	Dover	Rochester	Pease	Peirce	Exeter	Durham	Newmarket
Current							
Effluent Flow (MGD)	3.3	3.9	0.5	5.9	2.25	1.11	0.7
Monthly Effluent TN (mg/L)	-	-	-	-	-	-	-
Long Term Effluent TN (mg/L)	22	35	9	13	14	8	30
Scenario 1							
Effluent Flow (MGD)	3.3	3.9	0.5	5.9	2.25	1.11	0.7
Monthly Effluent TN (mg/L)	8	-	-	-	8	8	8
Long Term Effluent TN (mg/L)	6	14	9	13	6	6	6

7. Conclusion

EPA extensively relied upon the information from DES that it believed was reliable and scientifically defensible - the 2009 Criteria document and data in that document deemed by DES to show TN likely caused the eelgrass decline or low DO and the amended 2008 Section 303(d) List. However, now the State has found its 2009 Criteria document not to be scientifically defensible and eschewed further reliance on that document. Consequently, it would be arbitrary and capricious for EPA to continue to rely upon the 2009 Criteria document in future permitting decisions.

Furthermore, EPA is required under 40 C.F.R. § 122.44(d) to utilize current, relevant scientific data for the Estuary in setting effluent limitations. The updated data assessed based upon the more appropriate growing season average show that no significant changes in nutrient levels have occurred and that there is no connection between nutrient levels and fluctuating eelgrass populations or low DO. Lastly, the current information for this system confirms growing season TN is far lower than EPA had originally presumed (0.32 mg/l v. 0.42 mg/l). This more relevant data analysis confirms that only minor TN reductions would be needed to achieve a 0.3 mg/l TN level assuming that target was scientifically defensible and necessary to protect this estuarine system. Thus, based on these comments and the earlier comments submitted by the Coalition, we object to the Draft Permit as technically and legally unjustified and hereby request that the sections imposing additional requirements on the Great Bay communities be withdrawn.

Appendix A

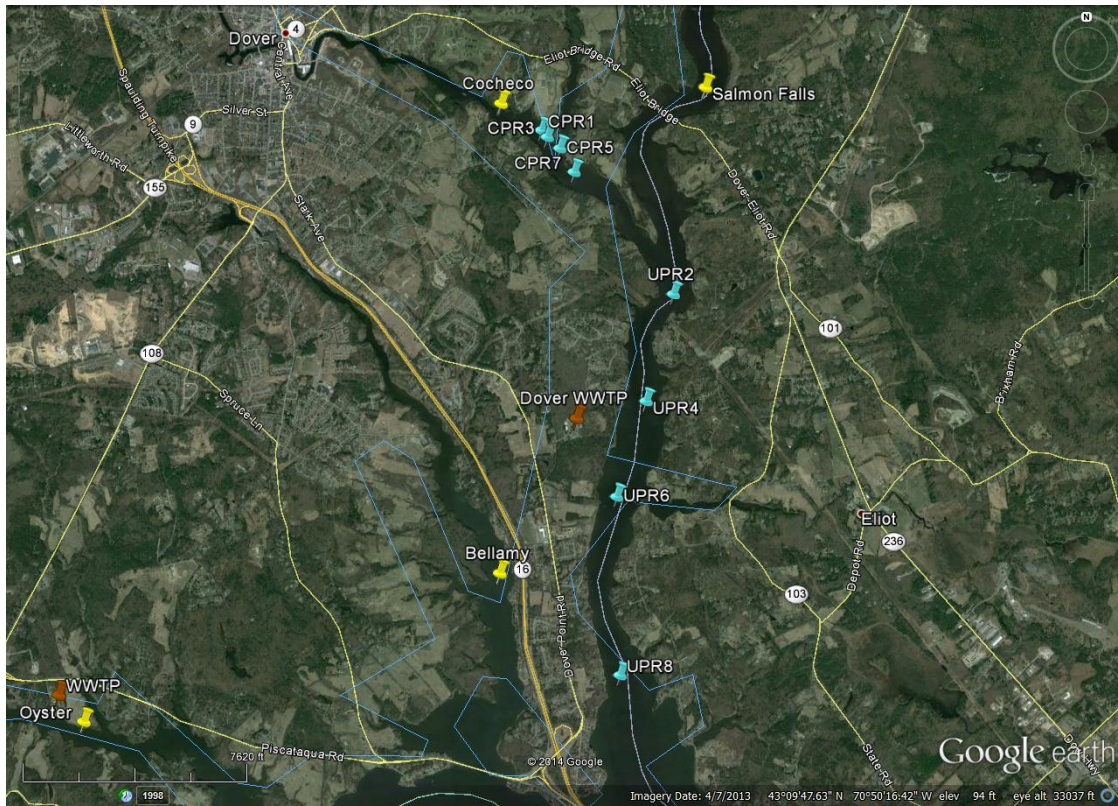


Figure 2. Map of the Upper Piscataqua River and Cocheco sampling locations.

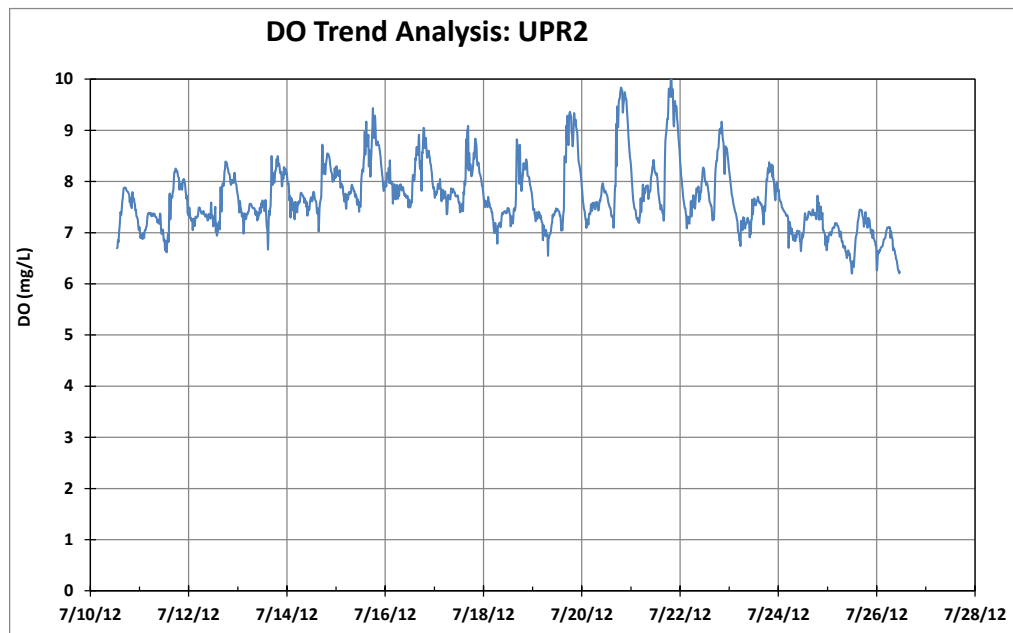


Figure 3. DO Trend Analysis for the Upper Piscataqua River Station UPR2

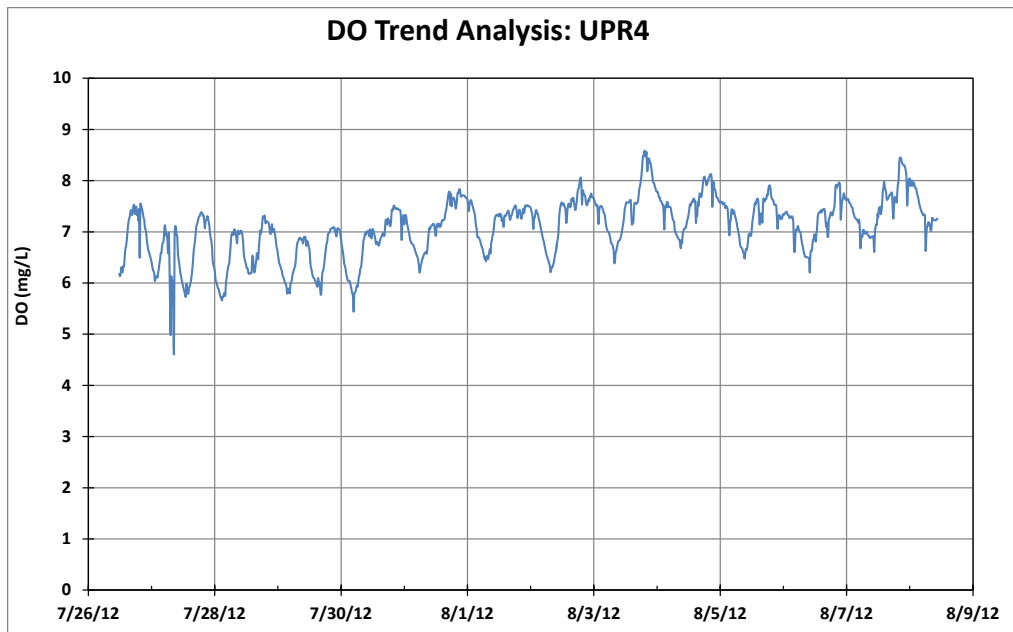


Figure 4. DO Trend Analysis for the Upper Piscataqua River Station UPR4

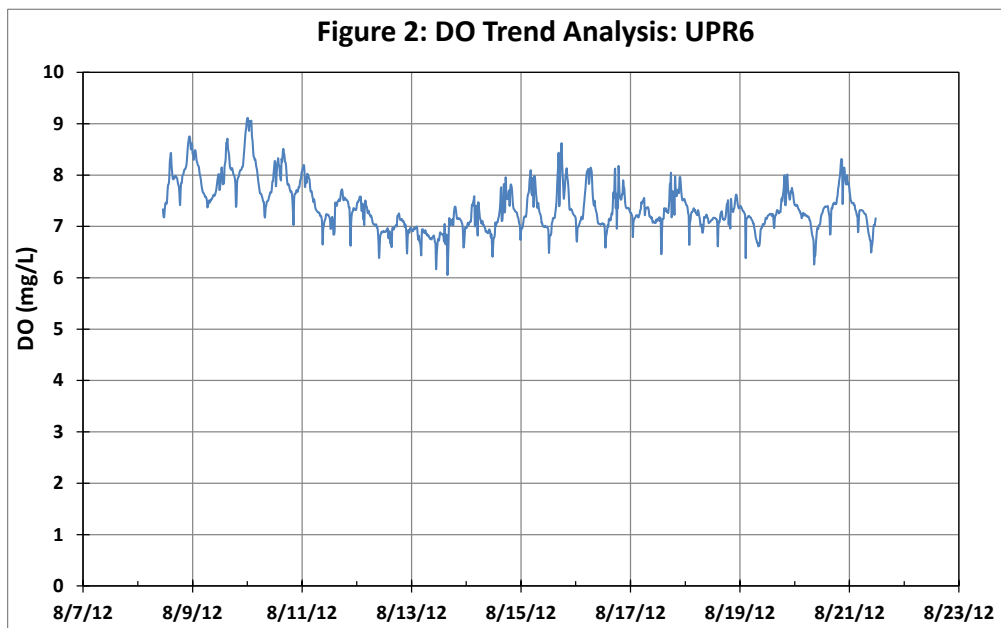


Figure 5. DO Trend Analysis for the Upper Piscataqua River Station UPR6

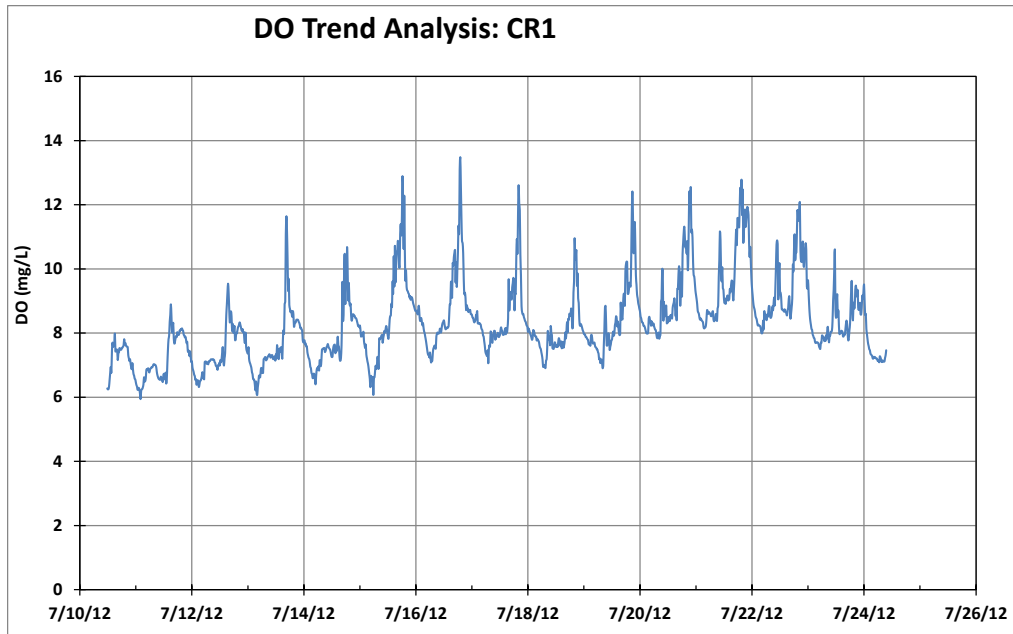


Figure 6. DO Trend Analysis for the Cocheco River Station CR1

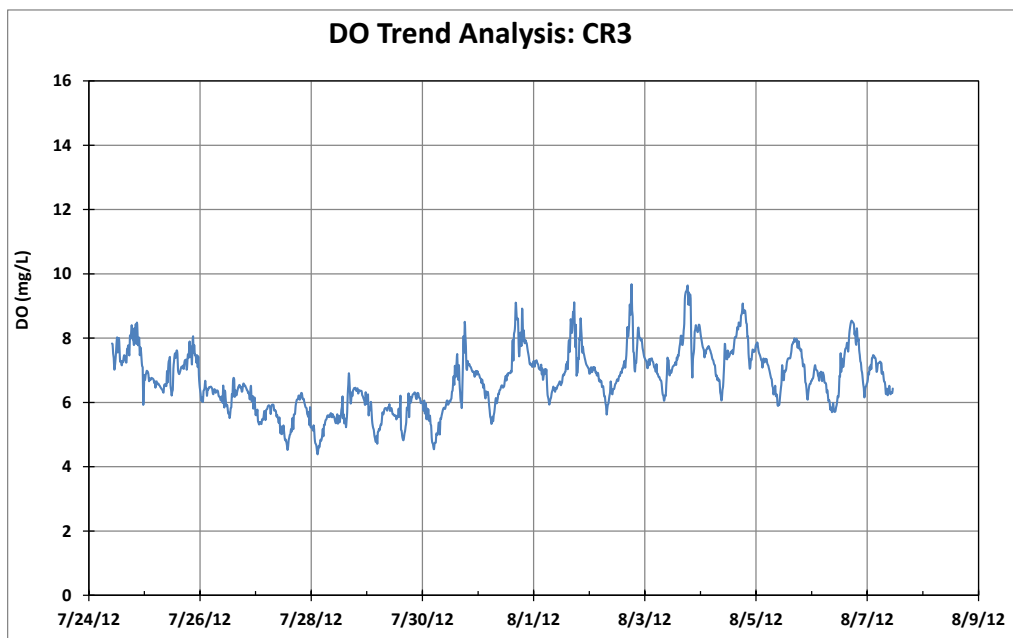


Figure 7. DO Trend Analysis for the Cocheco River Station CR3

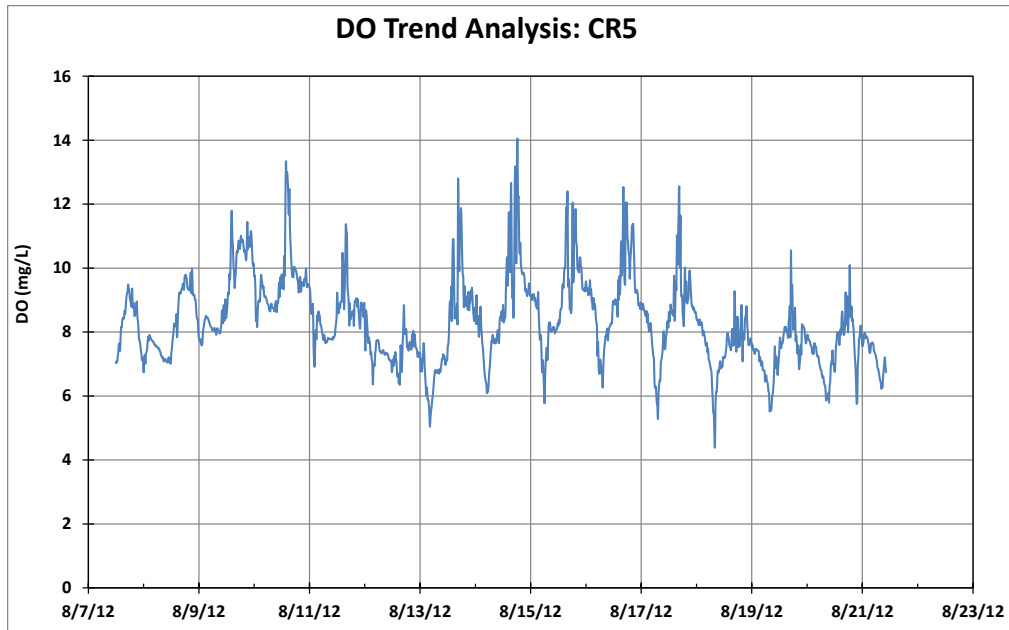


Figure 8. DO Trend Analysis for the Cocheco River Station CR5

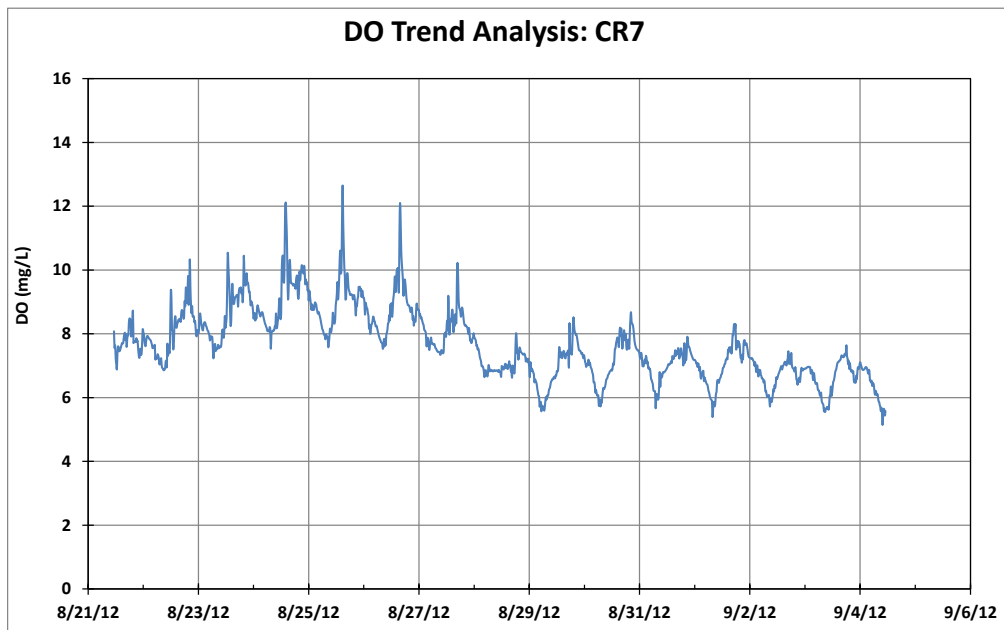


Figure 9. DO Trend Analysis for the Cocheco River Station CR7